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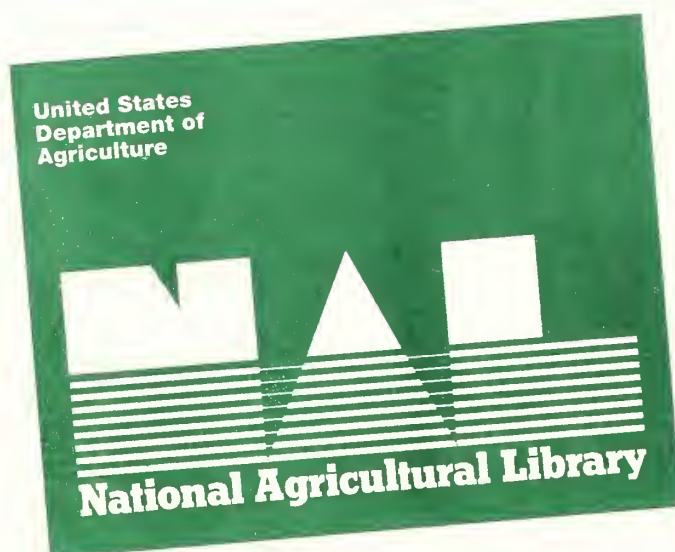
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for the
School Nutrition Program
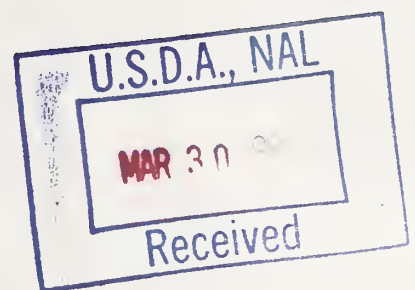
Food and Consumer Service
Alexandria, Virginia
November, 1997

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Lesson 1:

Introduction, Purpose of Nutrient Analysis, and Learning Outcomes

Introduction

With the publication of the Final Rule for USDA's *School Meals Initiative for Healthy Children* (SMI) on June 13, 1995, all schools became responsible for planning menus which meet specific minimum standards for key nutrients and calories by the beginning of SY '96-97. State agencies (SAs) were given the authority to grant waivers to SFAs to postpone implementation of the nutrition standards until no later than SY '98-99.

The SMI Rule, along with action by Congress, provides for four menu planning systems. Additionally, when guidelines are published by USDA, schools may request approval of additional menu planning systems which will achieve the nutrition goals of SMI.

School Meals Initiative for Healthy Children

Nutrition Goals

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┌─────────────────────────────────────────────────┐
│           USDA School Meals Initiative           │
│               for Healthy Children               │
│                                                   │
│                  Nutrition Goals                  │
│                                                   │
│  •  Recommended Dietary Allowances (RDA)          │
│     – 1/4 RDA for age/grade group for breakfast   │
│     – 1/3 RDA for age/grade group for lunch       │
│  •  Calorie Goals                                 │
│     – Appropriate for age/grade group             │
│  •  Dietary Guidelines for Americans              │
│     – Eat a variety of foods                      │
│     – Limit total fat to ≤ 30% of calories        │
│     – Limit saturated fat to < 10% of calories    │
│     – Choose a diet low in cholesterol            │
│     – Choose a diet with plenty of vegetables, fruits │
│       and grain products                          │
│     – Use salt and sodium in moderation           │
└─────────────────────────────────────────────────┘
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The *School Meals Initiative for Healthy Children* (SMI) underscores our national health responsibility to provide healthy school meals that are consistent with the Recommended Dietary Allowances (RDAs), the calorie goals and the Dietary Guidelines for Americans.

Menu Planning Systems and Nutrient Analysis:

The currently approved menu planning systems include two food-based menu planning systems:

- Enhanced Food-Based Menu Planning (the Enhanced Meal Pattern), and
- Traditional Food-Based Menu Planning (the Traditional Meal Pattern);

and two nutrient-based menu planning systems:

- Nutrient Standard Menu Planning (NSMP or NuMenus), and
- Assisted Nutrient Standard Menu Planning (ASNMP or Assisted NuMenus).

Meal pattern and menu item requirements for these menu planning systems are in Appendices A through E, pp. 5-9.

Nutrient-based menu planning requires the use of a computer and USDA-approved nutrient analysis software to plan menus which include the daily required menu items and, when averaged over the week, meet appropriate age/grade-based Nutrient Standards and the Dietary Guidelines. With NSMP (NuMenus), meal planning and analysis will be accomplished at the school or school district level; with ANSMP (Assisted NuMenus), the menus will be developed and analyzed by an entity other than the SFA.

In reviewing compliance with the requirements of SMI for school districts that use nutrient-based menu planning, the SA will assess the nutrient analysis for the last completed school week prior to the review period to determine if nutrient analysis methodology were applied appropriately. Part of the review will consist of a review of menus and production records to determine if they correspond to the analysis and if the menu, as offered, over a school week, meets the Nutrient Standards and the Dietary Guidelines.

The food-based menu planning systems provide age/grade-based meal patterns which require specific foods (components) in specific quantities. SFAs which use food-based menu planning are not required to perform nutrient

2

analyses but are still required to meet the Nutrient Standards and the Dietary Guidelines. The SA will conduct menu reviews which include performing nutrient analyses of the menus served during the review period to determine compliance with the Nutrient Standards and the Dietary Guidelines.

If a school district which uses food-based menu planning performs a nutrient analysis of planned menus using USDA-approved nutrient analysis software, the State agency may accept the nutrient analysis after determining that the analysis was conducted under the criteria established in the regulations.

Purpose of Nutrient Analysis:

The purpose of nutrient analysis is to **determine and compare the calories and certain nutrients contained in a menu to an appropriate nutrient standard and to monitor levels of certain dietary components.**

Performing an accurate nutrient analysis is critical to nutrient-based menu planning and to the evaluation of food-based menus. This training is designed to provide the learner with the knowledge and skills to perform an accurate nutrient analysis.

Learning Outcomes:

Upon completion of this training program, the participant will be able to:

1. Explain the purpose of nutrient analysis and the nutrition goals of the School Meals Initiative.
2. Select USDA-approved nutrient analysis software which will meet the needs of the SFA/SA.
3. Describe key points for nutrient analysis for schools and factors to consider when selecting food items and quantities from the Child Nutrition (CN) Database.
4. Assemble materials necessary for nutrient analysis.
5. Correctly enter data for food items (ingredients), recipes, menus, and school/SFA data following nutrient

analysis protocols for school nutrition programs.

6. Discuss common data entry errors and how to prevent/identify mistakes.

7. Perform nutrient analyses, evaluate data, and revise menus, if needed.

8. Print appropriate reports.

Appendix A: Enhanced Meal Pattern

Lunch

Minimum Quantities for Enhanced Meal Pattern Lunch					
	Required				Option
	Ages 1-2	Preschool	Grades K-6	Grades 7-12	Grades K-3
Meal Component					
Milk (as a beverage)	6 fl. oz.	6 fl. oz.	8 fl. oz.	8 fl. oz.	8 fl. oz.
Meat or Meat Alternate (quantity of the edible portion as served)					
Lean meat, poultry or fish	1 oz.	1 1/2 oz.	2 oz.	2 oz.	1 1/2 oz.
Cheese	1 oz.	1 1/2 oz.	2 oz.	2 oz.	1 1/2 oz.
Large egg	1/2	3/4	1	1	3/4
Cooked dry beans or peas	1/4 cup	3/8 cup	1/2 cup	1/2 cup	3/8 cup
Peanut butter or other nut or seed butters	2 Tablespoons	3 Tablespoons	4 Tablespoons	4 Tablespoons	3 Tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	4 oz. or 1/2 cup	6 oz. or 3/4 cup	8 oz. or 1 cup	8 oz. or 1 cup	6 oz. or 3/4 cup
The following may be used to meet no more than 50% of the requirement and must be used in combination with any of the above:					
Peanuts, soynuts, tree nuts, or seeds, as listed in program guidance, or an equivalent quantity of any combination of the above meat/meat alternate (1 ounce of nuts/seeds = 1 ounce of cooked lean meat, poultry or fish).	1/2 oz. = 50%	3/4 oz. = 50%	1 oz. = 50%	1 oz. = 50%	3/4 oz. = 50%
Vegetables/Fruits (2 or more servings of vegetables or fruits or both)	1/2 cup	1/2 cup	3/4 cup plus extra 1/2 cup over a week[1]	1 cup	3/4 cup
Grains/Breads Must be enriched or whole grain. A serving is a slice of bread or an equivalent serving of biscuits, rolls, etc., or ½ cup of cooked rice, macaroni, noodles, other pasta products or cereal grains.	5 servings per week[1] Minimum of 1/2 per day	8 servings per week[1] Minimum of 1 per day	12 servings per week[1] Minimum of 1 per day[2]	15 servings per week[1] Minimum of 1 per day[2]	10 servings per week[1] Minimum of 1 per day[2]

[1] For the purposes of this chart, a week equals five days.
[2] Up to one grains/breads serving per day may be a dessert.

Appendix B: Traditional Meal Pattern

Lunch

Minimum Quantities for Traditional Meal Pattern Lunch					
	Required				Recommended Quantities
	Group I, Age 1-2, (preschool)	Group II, Age 3-4, (preschool)	Group III, Age 5-8, (K-3)	Group IV, Age 9 and older (4-12)	Group V, 12 years and older (7-12)
Meal Component					
Milk (as a beverage)	6 fl. oz.	6 fl. oz.	8 fl. oz.	8 fl. oz.	8 fl. oz.
Meat or Meat Alternate (quantity of the edible portion as served)					
Lean meat, poultry or fish	1 oz.	1 1/2 oz.	1 1/2 oz.	2 oz.	3 oz.
Cheese	1 oz.	1 1/2 oz.	1 1/2 oz.	2 oz.	3 oz.
Large egg	1/2	3/4	3/4	1	1 1/2
Cooked dry beans or peas	1/4 cup	3/8 cup	3/8 cup	1/2 cup	3/4 cup
Peanut butter or other nut or seed butters	2 Tablespoons	3 Tablespoons	3 Tablespoons	4 Tablespoons	6 Tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	4 oz. or 1/2 cup	6 oz. or 3/4 cup	6 oz. or 3/4 cup	8 oz. or 1 cup	12 oz. or 1 1/2 cups
The following may be used to meet no more than 50% of the requirement and must be used in combination with any of the above:					
Peanuts, soynuts, tree nuts, or seeds, as listed in program guidance, or an equivalent quantity of any combination of the above meat/meat alternate (1 ounce of nuts/seeds = 1 ounce of cooked lean meat, poultry or fish).	1/2 oz. = 50%	3/4 oz. = 50%	3/4 oz. = 50%	1 oz. = 50%	1 1/2 oz. = 50%
Vegetables/Fruits (2 or more servings of vegetables or fruits or both)	1/2 cup	1/2 cup	1/2 cup	3/4 cup	3/4 cup
Grains/Breads Must be enriched or whole grain. A serving is a slice of bread or an equivalent serving of biscuits, rolls, etc., or ½ cup of cooked rice, macaroni, noodles, other pasta products or cereal grains.	5 servings per week[1] Minimum of 1/2 per day	8 servings per week[1] Minimum of 1 per day	8 servings per week[1] Minimum of 1 per day	8 servings per week[1] Minimum of 1 per day	10 servings per week[1] Minimum of 1 per day

[1] For the purposes of this chart, a week equals five days.

Appendix C: Enhanced Meal Pattern

Breakfast

Minimum Quantities for Enhanced Meal Pattern Breakfast				
	Required			Option
	Ages 1-2	Preschool	Grades K-12	Grades 7-12
Meal Component				
Milk (Fluid) (As a beverage, on cereal or both)	1/2 cup	3/4 cup	8 fl. oz.	8 fl. oz.
Juice/Fruit/Vegetable Fruit and/or vegetable; or full-strength fruit juice or vegetable juice	1/4 cup	1/2 cup	1/2 cup	1/2 cup
Select <u>one</u> serving from each of the following components or <u>two</u> from one component:				
Grains/Breads One of the following or an equivalent combination:				
Whole grain or enriched bread	1/2 slice	1/2 slice	1 slice	1 slice
Whole grain or enriched biscuit/roll, muffin, etc.	1/2 serving	1/2 serving	1 serving	1 serving
Whole grain, enriched or fortified cereal	1/4 cup or 1/3 oz.	1/3 cup or 1/2 oz.	3/4 cup or 1 oz.	3/4 cup or 1 oz. <u>Plus</u> an additional serving of one of the grains/breads above
Meat or Meat Alternates:				
Meat/poultry or fish	1/2 oz.	1/2 oz.	1 oz.	1 oz.
Cheese	1/2 oz.	1/2 oz.	1 oz.	1 oz.
Egg (large)	1/2	1/2	1/2	1/2
Peanut butter or other nut or seed butters	1 Tablespoon	1 Tablespoon	2 Tablespoon	2 Tablespoon
Cooked dry beans and peas	2 Tablespoons	2 Tablespoons	4 Tablespoons	4 Tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	2 oz. or 1/4 cup	2 oz. or 1/4 cup	4 oz. or 1/2 cup	4 oz. or 1/2 cup
Nut and/or seeds (as listed in program guidance)[1]	1/2 oz.	1/2 oz.	1 oz.	1 oz.

[1] No more than 1 oz. of nuts and/or seeds may be served in any one meal.

Breakfast

Minimum Quantities for Traditional Meal Pattern Breakfast			
	Minimum quantities required for		
	Ages 1-2	Ages 3, 4, and 5	Grades K-12
Meal Component			
Milk (Fluid) (As a beverage, on cereal or both)	4 fl. oz. or 1/2 cup	6 fl. oz. or 3/4 cup	8 fl. oz. or 1 cup
Juice/Fruit/Vegetable Fruit and/or vegetable; or full-strength fruit juice or vegetable juice	1/4 cup	1/2 cup	1/2 cup
Select <u>one</u> serving from each of the following components or <u>two</u> from one component:			
Grains/Breads One of the following or an equivalent combination:			
Whole grain or enriched bread	½ slice	½ slice	1 slice
Whole grain or enriched biscuit/roll, muffin, etc.	1/2 serving	1/2 serving	1 serving
Whole grain, enriched or fortified cereal	1/4 cup or 1/3 oz.	1/3 cup or 1/2 oz.	3/4 cup or 1 oz.
Meat or Meat Alternates:			
Meat/poultry or fish	1/2 oz.	1/2 oz.	1 oz.
Cheese	1/2 oz.	1/2 oz.	1 oz.
Egg (large)	1/2	1/2	1/2
Peanut butter or other nut or seed butters	1 Tablespoon	1 Tablespoon	2 Tablespoon
Cooked dry beans and peas	2 Tablespoons	2 Tablespoons	4 Tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	2 oz. or 1/4 cup	2 oz. or 1/4 cup	4 oz. or 1/4 cup
Nut and/or seeds (as listed in program guidance)[1]	1/2 oz.	1/2 oz.	1 oz.

[1] No more than 1 oz. of nuts and/or seeds may be served in any one meal.

Appendix E: Meal Requirements for NSMP (NuMenus) and ANSMP (Assisted NuMenus): Lunch and Breakfast

	Daily Requirement	**Weekly Requirement**
Lunch	<u>Minimum</u> of three (3) Menu Items: • Entree - a combination of foods or a single food item that is served as the main course • Fluid milk - as a beverage • Side dish - any other menu item that is not a condiment or a Food of Minimal Nutritional Value served alone, that is, not served as part of another item	When averaged over a school week, meals must meet the appropriate age/grade-based Nutrient Standard.
Breakfast	<u>Minimum</u> of three (3) Menu Items: • Fluid milk - served as a beverage or on cereal or both • 2 side dishes - two other menu items that are not a condiment or a Food of Minimal Nutritional Value served alone, that is, not served as part of another menu item	When averaged over a school week, meals must meet the appropriate age/grade-based Nutrient Standard.

Lesson 2:

The Nutrient Standards

A nutrient standard is the required level of calories and certain nutrients for a specific grade or age group. The nutrient standards were established to serve as a measure of the nutritional quality of school meals.

Regulations require that planned and offered breakfast and/or lunch menus averaged over a week meet the nutrient standard for the age or grade group for which they are intended. Meeting these standards is the goal for *all* menu planning systems.

Calories and Nutrients in the Nutrient Standards:

Standards are set for:

- Calories
- ≤ 30% calories from total fat
- < 10% calories from saturated fat
- Protein
- Calcium
- Iron
- Vitamin A
- Vitamin C

It is important to point out that the nutrient standards for calories, protein, calcium, iron, vitamin A, and vitamin C are *minimums*, and the nutrient standards for the percentage of calories from total fat and saturated fat are *maximums*.

Maintenance of calories is probably the most important nutrient standard. Menu planners need to ensure adequate, consistent calorie levels to meet children's energy and growth needs by keeping daily calories close to the standard. Serving too much food and too many calories one day and too little food and too few calories on another day may average out, but a real disservice would be done to students whose energy and growth needs could not be met on days when too few calories are offered.

Meeting a Child's Overall Nutrient Needs:

USDA recognizes that the nutrient standards do not include all the nutrients for which Recommended Dietary Allowances (RDAs) have been established. Monitoring only the nutrients for which nutrient standards have been established should still ensure that a child's overall nutrient needs are met, because the foods which naturally contain those nutrients typically contain the other essential nutrients which are not specified in the nutrient standards.

However, USDA cautions that unrestricted use of a few highly fortified foods to meet the established target nutrients in the nutrient standards may result in shortages in some essential nutrients for which nutrient standards have not been established.

In addition, recent nutrition research indicates that, for optimum health, humans also need a variety of biologically-active compounds that occur in a variety of conventional foods, e.g., fruits, vegetables, and whole grains. This research is still in its early stages and there is much to be learned, but we do know that conventional foods are needed to meet these needs.

USDA is committed to the principle that meals be comprised of a variety of foods which provide naturally occurring nutrients, as recommended in the Dietary Guidelines, rather than formulated foods which have been artificially fortified.

Other Nutrients and Dietary Components Analyzed:

- Cholesterol
- Dietary fiber
- Sodium
- Carbohydrate (optional)

Other nutrients and dietary components that will be analyzed during the nutrient analysis are cholesterol, sodium, and dietary fiber. While there are no quantity standards set for cholesterol, sodium, and dietary fiber, they must be included in the analysis. Analyzing carbohydrate may be included, but is optional. Cholesterol, dietary fiber and sodium will be monitored over time to check on the implementation of the Dietary Guidelines:

1. Are cholesterol and sodium levels going down?
2. Is the dietary fiber level going up?

Nutrient Standards are Grade-Based or Age-Based:

Grade-based nutrient standards have been established for food-based menu planning and for nutrient-based menu planning. Optional age-based nutrient standards have also been established for nutrient-based menu planning. In addition, SFAs using nutrient-based menu planning may create customized age-based nutrient standards to correspond to the age groups in their schools.

Nutrient standards have not been established for infants and children ages 1-2 because the Dietary Guidelines do not apply to children under 2 years of age.

Nutrient Standards for Food-Based Menu Planning – Enhanced Meal Pattern and Traditional Meal Pattern:

Minimum Required Grade Groups for Enhanced Meal Pattern: Lunch

- Preschool
- Grades K-6
- Grades 7-12
- Optional group for grades K-3

Nutrient Standards for Minimum Required Grade Groups for Enhanced Meal Pattern: Lunch

Calorie and Nutrient Levels for School Lunch (school week averages)				
	Pre-School	Grades K-6	Grades 7-12	Option Grades K-3
Energy Allowances (calories)	517	664	825	633
Total fat	[1]	[1]	[1]	[1]
Total saturated fat	[2]	[2]	[2]	[2]
Protein (g)	7	10	16	9
Calcium (mg)	267	286	400	267
Iron (mg)	3.3	3.5	4.5	3.3
Vitamin A (RE)	150	224	300	200
Vitamin C (mg)	14	15	18	15

[1] Total fat not to exceed 30 percent of calories over a school week
[2] Saturated fat to be less than 10 percent of calories over a school week

Minimum Required Grade Groups for Traditional Meal Pattern: Lunch

- Preschool
- Grades K-3
- Grades 4-12
- Optional group for grades 7-12

Nutrient Standards for Minimum Required Grade Groups for Traditional Meal Pattern: Lunch

Calorie and Nutrient Levels for School Lunch (school week averages)				
	Pre-School	Grades K-3	Grades 4-12	Option Grades 7-12
Energy Allowances (calories)	517	633	785	825
Total fat	[1]	[1]	[1]	[1]
Total saturated fat	[2]	[2]	[2]	[2]
Protein (g)	7	9	15	16
Calcium (mg)	267	267	370	400
Iron (mg)	3.3	3.3	4.2	4.5
Vitamin A (RE)	150	200	285	300
Vitamin C (mg)	14	15	17	18

[1] Total fat not to exceed 30 percent of calories over a school week

[2] Saturated fat to be less than 10 percent of calories over a school week

Minimum Required Grade Groups for Enhanced and Traditional Meal Patterns: Breakfast

- Preschool
- Grades K-12
- Optional group for grades 7-12 for Enhanced Meal Pattern

Nutrient Standards for Minimum Required Grade Groups for Enhanced and Traditional Meal Patterns: Breakfast

Calories and Nutrient Levels for School Breakfast (school week averages)			
	Pre-school	Grades K-12	Optional Grades 7-12 for Enhanced Meal Pattern
Energy Allowances (calories)	388	554	618
Total fat	1	1	1
Total saturated fat	2	2	2
Protein (g)	5	10	12
Calcium (mg)	200	257	300
Iron (mg)	2.5	3.0	3.4
Vitamin A (RE)	113	197	225
Vitamin C (mg)	11	13	14

[1] Total fat not to exceed 30 percent of calories over a school week
[2] Saturated fat to be less than 10 percent of calories over a school week

The food-based menu planning groups are designed to reflect the differing nutrient and calorie needs of younger and older children while also accommodating the grade structure of the majority of schools.

Food-Based Menu Planning: Pattern = Standard

Provided that an appropriate pattern is used for menu planning, meals served using a specific meal pattern will be reviewed against the nutrient standard for that meal pattern, regardless of the grade levels in the school. This means that a junior high school (Grades 7-9) implementing the Traditional Meal Pattern for Group IV (Grades 4-12) would be reviewed against the nutrient standard for Grades 4-12.

Nutrient Standards for Nutrient-Based Menu Planning – NSMP (NuMenus) and ANSMP (Assisted NuMenus):

Minimum Required Grade Groups for NSMP and ASNMP: Lunch

- Preschool
- Grades K-6
- Grades 7-12
- Optional group for grades K-3

Nutrient Standards for Minimum Required Grade Groups for NSMP and ANSMP: Lunch

Calorie and Nutrient Levels for School Lunch (school week averages)				
	Pre-School	Grades K-6	Grades 7-12	Option Grades K-3
Energy Allowances (calories)	517	664	825	633
Total fat	[1]	[1]	[1]	[1]
Total saturated fat	[2]	[2]	[2]	[2]
Protein (g)	7	10	16	9
Calcium (mg)	267	286	400	267
Iron (mg)	3.3	3.5	4.5	3.3
Vitamin A (RE)	150	224	300	200
Vitamin C (mg)	14	15	18	15

[1] Total fat not to exceed 30 percent of calories over a school week

[2] Saturated fat to be less than 10 percent of calories over a school week

Minimum Required Grade Groups for NSMP and ANSMP: Breakfast

- Preschool
- Grades K-12
- Optional group for grades 7-12

Nutrient Standards for Minimum Required Grade Groups for NSMP and ANSMP: Breakfast

Calories and Nutrient Levels for School Breakfast (school week averages)			
	Pre-school	Grades K-12	Option Grades 7-12
Energy Allowances (calories)	388	554	618
Total fat	1	1	1
Total saturated fat	2	2	2
Protein (g)	5	10	12
Calcium (mg)	200	257	300
Iron (mg)	2.5	3.0	3.4
Vitamin A (RE)	113	197	225
Vitamin C (mg)	11	13	14

[1] Total fat not to exceed 30 percent of calories over a school week
[2] Saturated fat to be less than 10 percent of calories over a school week

Optional Age Groups for NSMP and ANSMP: Lunch and Breakfast

For NSMP and ANSMP, schools have the option to provide the calorie and nutrient levels for school lunches and breakfasts for the age groups below:

- Ages 3-6
- Ages 7-10
- Ages 11-13
- Ages 14-17

These age groups allow the menu planner to develop menus that are more accurately targeted to the nutritional needs of children.

Nutrient Standards for Optional Age Groups for NSMP and ANSMP: Lunch

Minimum Calorie and Nutrient Levels for School Lunch (school week averages for age groups)				
Nutrients and energy allowances	Ages 3-6	Ages 7-10	Ages 11-13	Ages 14 and older
Energy Allowances/Calories	558	667	783	846
Total Fat	1	1	1	1
Saturated Fat	2	2	2	2
RDA for Protein (g)	7.3	9.3	15.0	16.7
RDA for calcium (mg)	267	267	400	400
RDA for Iron (mg)	3.3	3.3	4.5	4.5
RDA for Vitamin A (RE)	158	233	300	300
RDA for Vitamin C (mg)	14.6	15.0	16.7	19.2

[1] Total fat not to exceed 30 percent of calories over a school week.

[2] Saturated fat to be less than 10 percent of calories over a school week.

Nutrient Standards for Optional Age Groups for NSMP and ANSMP: Breakfast

Minimum Calorie and Nutrient Levels for School Breakfast (school week averages for age groups)				
Nutrients and energy allowances	Ages 3-6	Ages 7-10	Ages 11-13	Ages 14 and older
Energy Allowances/Calories	419	500	588	625
Total Fat	1	1	1	1
Saturated Fat	2	2	2	2
RDA for protein (g)	5.50	7.00	11.25	12.50
RDA for calcium (mg)	200	200	300	300
RDA for Iron (mg)	2.5	2.5	3.4	3.4
RDA for Vitamin A (RE)	119	175	225	225
RDA for Vitamin C (mg)	11.00	11.25	12.50	14.40

[1] Total fat not to exceed 30 percent of calories over a school week.
[2] Saturated fat to be less than 10 percent of calories over a school week.

Optional Customized Age Groups for NSMP and ANSMP

Schools planning menus using NSMP or ANSMP have the option of creating their own customized age groupings and nutrient standards for menu planning to match the grade structures in their schools. For example, a school district divides its schools as follows:

- preschool and kindergarten (Pre-K to K),
- elementary (Grades 1-6),
- junior high school (Grades 7-9), and
- high school (Grades 10-12).

This school district may wish to create age-based nutrient standards which reflect those grades. The nutrient standards they would create would be as follows:

- Ages 3-5 for Pre-K to K,
- Ages 6-11 for Grades 1-6,
- Ages 12-14 for Grades 7-9, and
- Ages 15-17 for Grades 10-12.

By creating their own nutrient standards, the school district could better plan meals to meet the nutrient needs of the students attending their schools.

The menu planner will use the USDA-approved software to establish the nutrient standards for breakfast and for lunch for the customized age groups and will plan menus to meet the new nutrient standards.

For lunch, at least two nutrient standards should be used with any school that has grades K-12. Where such a broad spectrum of ages and grades are present, the standard should be changed at or right above the sixth grade level because of the concern discussed below:

Special consideration at age 11

Menu planners should always be aware that the greatest differential in caloric needs occurs between ages 10-11 or between grades 5-6. A one-year age difference does not make a great difference in the RDA requirements for each nutrient when weighted for the predominant group. However, when several ages are added in on either side of the 10-11 age break, either too few nutrients and calories will be provided for those 11+ years or too many calories and nutrients will be provided for 10 years and under.

Special Rules for Menu Planning for NSMP and ANSMP

Not all schools' grade structures will match the nutrient standard grade or age groups. If only one age or grade is outside the established levels, a school or group of schools may use the nutrient standard levels for the majority of children regardless of the nutrient standard option selected. However, when more than one grade or age is outside of the established levels, the menu planner must use two of the required groups or develop a customized age group.

NSMP or ANSMP

If Age or Grade Groupings Differ:
- Use two standards or
- Create a customized age standard or
- If only one age or grade is outside, use majority standard

Required grade groups

For example, when using the required grade groups chart, if there is more than one grade beyond grade 6 or below grade 7 in the school, two grade groups for lunch should be used. Grade K-8 or grade 5-8 schools should have at least two grade groups for menu planning. Grade K-7 or grade 6-9 schools, however, could include the one grade outside the group in the predominant grades K-6 and grades 7-12 groups, respectively.

If the menu planner is planning centralized menus for several schools with grades within the K-6 range, even though the schools have varying age or grade groups, all of the menus may be planned to meet the nutrient standard for grades K-6 rather than customizing a standard for each school.

Lesson 3:

The Child Nutrition Database and USDA-Approved Nutrient Analysis Software for School Nutrition Programs

Why the Child Nutrition Database Was Created

The Food and Consumer Service (FCS) of the U.S. Department of Agriculture (USDA) recognizes that the success of nutrient-based menu planning and the State monitoring of compliance with the nutrition goals for food-based menus is dependent on an accurate nutrient analysis of the recipes and the breakfast and lunch meals served in schools.

Prior to creating the Child Nutrition (CN) Database, USDA staff evaluated more than 15 nutrient analysis software packages. They determined that there was an absence of accurate, complete and verified databases. In general:

- Databases did not contain the types of foods, descriptions, weights and measurements commonly used in child nutrition programs. Specifically, food descriptions were inconsistent and not standardized.
- Many databases contained incomplete and missing nutritional values, which could lead to inaccuracy in nutrient calculations and a misinterpretation of the nutritional analysis.
- The databases contained a limited number of brand name food products for institutional use.
- There was no evidence of quality control in many databases and in others the tolerance level for inaccuracy was very high.

Recognizing the need for accurate, reliable, complete, and centralized nutrient data, FCS in cooperation with the

Agricultural Research Service (ARS) developed the CN Database for use in nutrient analysis of school meals.

Component Files of the CN Database

The CN Database contains five component files: a standard reference file, a file of USDA commodities, a file of the USDA quantity recipes for schools, a brand name processed foods file, and a file containing the USDA *Food Buying Guide*. These files are locked, which means that the information in those files may be accessed and copied, but may not be altered by the local user. Food identification codes or numbers are reserved for use in the CN Database.

In addition, the software provides users the ability to compile a local database for food items that do not appear in the CN Database. An SFA will need to enter into their local database any foods not listed in the CN Database that are offered on school menus.

Child Nutrition Database Contents

1. Standard Reference Foods

This locked file contains over 1800 of the foods most commonly used in school meals from the Agricultural Research Service's (ARS's) Nutrient Data Base for Standard Reference. The nutrient data for the standard reference food products are developed and updated on a regular basis by ARS.

Food categories in the Standard Reference file include:

Baked Goods	Fats and Oils	Nuts and Seeds
Beef	Fish	Poultry
Beverages	Fruits/Juices	Pork
Cereals	Grains	Snacks and Sweets
Condiments	Lamb	Soups, Sauces, Gravies
Dairy Products and Eggs	Luncheon Meats and Sausage	Spices
		Vegetables

2. USDA Commodities

This locked file contains the current USDA commodity foods available to schools.

3. USDA Quantity Recipes for School Food Service

This locked file contains all current USDA quantity recipes for school food service, including new recipes developed for the school nutrition program in *A Tool Kit for Healthy School Meals*.

Only the nutrient information is included in the CN Database, not the recipe ingredients and directions, because the nutrient analysis data were obtained using a more complex recipe analysis method which gives more precise nutrient data. If a school uses the USDA recipe exactly as displayed on the recipe card (first listed ingredient when alternates are listed and no optional ingredients), the CN Database item should be selected.

How nutrient analyses of USDA recipes were calculated:

a) **Based on first ingredient only**: When USDA recipes show alternate ingredient choices, the nutrient analysis is based on the first ingredient listed, not the alternate ingredient.

> Example:
>
> ### Recipe D-13 Beef or Pork Taco
>
> Raw ground beef or raw ground pork is listed. The recipe analysis is based on the first ingredient listed, raw ground beef. Therefore, if the school district uses raw ground pork to prepare this recipe, the correct recipe must be entered into the local database and the nutrient analysis recalculated.

b) **Optional ingredients are not included**: The nutrient analysis does not include any ingredients listed as optional.

> Example:
>
> ### Recipe D-20 Chili Con Carne with Beans
>
> Cheddar cheese is an optional ingredient in this recipe and was not included in the nutrient analysis. If cheddar cheese is included as an ingredient in the

recipe, the recipe including cheddar cheese must be entered into the local database and the nutrient analysis recalculated.

c) **Variations of USDA recipes**: Some, but not all, recipe variations are included in the database.

Example:

Recipe B-4 Baking Powder Biscuits

Lists four variations:
1. B-4a Baking Powder Biscuit using Master Mix
2. B-4b Cheese Biscuits
3. B-4c Drop Biscuits
4. B-4d Wheat Biscuits

Each of these recipe variations *is* included in the database, but many other variations are not. If the school district is using a variation of a recipe that is not in the database, the recipe variation must be entered into the local database and the nutrient analysis recalculated.

Because so many schools use alternate or optional ingredients or variations of USDA recipes, some software companies have entered the USDA recipes into their local database so that schools will be able to easily modify the recipe, rather than having to enter the entire recipe with the alternate ingredient or variation into the local database.

4. Brand Name Processed Foods

FCS recently contracted with Sales Partner Systems, Inc. (SPS) to manage the CN Database. SPS is a working partner with the International Food Distributor's Association (IFDA) and currently manages a database of more than 35,000 food service product descriptions for over 260 manufacturers.

Since numerous processed products are used by schools, manufacturers are encouraged to submit nutritional information for their products to SPS so they can be added to the CN Database. This saves data entry time for local schools and makes nutritional information on those products available nationwide. A sample of the form to be completed by manufacturers for submission of data to SPS is in Appendix B on pp. 29-30.

It should be noted that SPS has a fee schedule for this service. For information on the fee schedule and details on

how to submit data, manufacturers may contact SPS at the following address and telephone number:

Sales Partner Systems, Inc.
770 West Granada Boulevard, Suite 116
Ormond Beach, FL 32174
Telephone: 1-(800) 777-2924
Extension: 152 (Patty Kraft)

5. USDA *Food Buying Guide*

This locked file contains the information needed to purchase the correct food quantities and to determine raw to cooked yields for recipe analysis.

The Local Database

The USDA-approved nutrient analysis software provides the ability to compile a local database for food items. Foods not listed in the CN Database must be entered into the local database if they are offered on school menus. These foods will need to be entered by local school food service personnel or by State reviewers.

As discussed previously, some software companies have entered the USDA recipes with their ingredients into their local database. While this promotes easy recipe modification, it is important to note that these recipes are not part of the CN Database and have not been reviewed by USDA for accuracy. In addition, some software companies have developed a local database which contains nutrient analysis data on purchased products. SFAs/State agencies are cautioned that these local databases may not have the same quality control monitoring as the CN Database, and may contain errors and/or missing data.

Regardless of the menu planning system used, SFAs are responsible for obtaining correct and complete nutrient analysis data on products which are used by the SFA but which are not in the CN Database in order that an accurate nutrient analysis of school meals will be obtained.

Local Products and Ingredients

Only locally-entered products and ingredients may be modified or deleted from the database. The procedure for adding a food to the local database will vary in order and method, depending on the nutrient analysis software program.

It is important that schools follow their software program's instructions on developing a local database.

CN Database Updates

The CN Database will be updated periodically to include new products. Food ingredients and nutrient data entered into the local database should not be lost or deleted when your software is updated with a new version of the CN Database. As a precautionary measure, SFAs/State agencies should make backup files to a disk before updating. When an update of the CN Database includes a food item that a school district has previously entered locally, that food item should be deleted from the district's local database.

Nutrient Analysis Software for School Nutrition Programs

The CN Database is a required component of nutrient analysis software developed by software companies specifically for use in the analysis of school meals.

The software selected for NSMP and ANSMP must be approved by USDA. State agencies will also use USDA-approved software during state monitoring of food-based menu planning systems. All USDA-approved nutrient analysis software will perform the following functions:

- The user will be able to enter new food items from nutrient analysis information provided in a manufacturer's nutrient analysis data sheet or Nutrition Facts label.
- The user will be able to enter and modify recipes and obtain nutrient analyses of the recipes.
- The user will be able to plan, modify and copy menus and to obtain a nutrient analysis for each menu or for a week of menus (3-7 days).
- The user will be able to create new nutrient standards for a specific age category.
- The software will compare a menu to a specific nutrient standard and indicate when standards are not being met.
- The software will print reports, such as nutrient composition, menus, production records, etc.

A more detailed description of the software requirements and functions is provided in Appendix A on page 28.

State agencies will have a list of current USDA-approved nutrient analysis software packages. This information is also available on the Internet through the **Healthy School Meals Resource System** at the following Internet address: **http://schoolmeals.nal.usda.gov:8001**.

Appendix A: Software Requirements

Description of Software Requirements and Functions

Nutrient Standard Menu Planning software which meets the specifications for use in the Child Nutrition Program must comply with the following criteria:

All of the appropriate files and fields from the Child Nutrition (CN) Database must be incorporated into the software (standard reference foods, USDA standardized recipe food items, commodity foods, manufacturer's foods, weights and measures, and the USDA *Food Buying Guide*). Information provided by the CN Database cannot be altered by users; however, user-entered information can be edited or deleted.

The user will be able to enter new food items into a local database from information provided in a manufacturer's fact sheet or food label in nutrients per serving or specific weight, or percent of the Daily Reference Value (DRV). The software will automatically convert measures for weight and volume (if available) at all levels of item entry, recipe development, and menu planning.

The user will be able to enter recipes; the software will produce a recipe report that includes the recipe code number, recipe name, serving/portion size, yield of the recipe based on number of servings, ingredients, the amount of each ingredient in units appropriate for food service, preparation instructions, and nutrient value of the recipe per serving or per 100 g (with nutrient changes calculated due to moisture/fat factors). The Recipe Nutrient Composition Report will contain the nutrient value contributed by each ingredient and the total nutrient value of the recipe per serving or per 100 g. The yield of the recipe will be able to be accurately adjusted to meet the needs of the food service without degrading the base recipe. A Recipe/Ingredient Cross Reference report will identify recipes that contain a certain food ingredient.

Menus for a specific site can be developed and copied to another site or data range and the serving sizes adjusted for various age groups. Menu Reports will be available in both calendar and report formats. A Menu Production Record can be printed for use by food service workers to determine the quantities and serving sizes of food to prepare for a specific site.

The Standard and Modified RDA data sets provided USDA are incorporated into the software and used for comparison in nutrient analyses. A new nutrient standard (e.g., age 5-11) can be created, simply by entering the age or age range of the new grouping. A Weighted Nutrient Analysis of an individual menu or range of menu dates can be provided. A summary of the calculated nutrient value of the menu is then compared to the nutrient standards of a selected age group and deficiencies highlighted. The software will search the database for food items containing specific nutrients, so that menus can be adjusted to meet the nutrient standards.

The nutrient composition of all food items and recipes in the databases (CN Database and local database) can be printed, including all nutrients/components (calories, protein, carbohydrate, fat, saturated fat, Vitamin A, Vitamin C, iron, calcium, cholesterol, sodium, dietary fiber, and the percentage of calories from protein, carbohydrate, fat, and saturated fat).

Training Documents and the User's Manual must be presented in a complete, sequential, easy-to-understand format. The developer must have a system to update the database whenever a new release of the CN Database is available.

Appendix B: Sample Form for Submission of Nutrient Analysis Data

Please enter the name and address of the person who should be contact for additional information.

Product Number should be your product's 5 digit UPC #.

The shortened product name is built using the USDA standard for abbreviations. We can complete this for you or please ask us for the abbreviation listing.

The Unit UPC and the **Shipping Container UPC** are very important for correctly matching the information to the product.

The CNP Food Category comes from a USDA Table. Please select from the following list of 2 digit categories.

1   Dairy:btr,cheese,eggs,milk,ygrt
2   Spices: seasonings, flavorings, leavenings, leavening agents
3   Baby food
4   Fats & Oils:margarine, shrtng, mayonnaise, salad dressings
5   Poultry: chicken, turkey
6   Soups, Sauces and Gravies
7   Luncheon meat & sausage
8   Cereals
9   Fruits and Fruit Juices
10 Pork
11 Vegetables:inc.beans& legumes
12 Nuts and seeds
13 Beef
14 Beverages
15 Fish
16 Condiments:bread,mstrd,relsh
17 Lamb
18 Baked goods: bread, cakes, cookies, crackers etc.
19 Snacks and Sweets
20 Grains
29 Miscellaneous
30 General Recipes
31 Bread & Cereal Recipes
32 Dessert Recipes
33 Main Dish Recipes
34 Salad and dressing Recipes
35 Sandwich Recipes
36 Sauce and Gravy Recipes
37 Soup Recipes
38 Vegetable Recipes
39 Breakfast Recipes
43 Purch. mx dish:lunch entrees
44 Purch mxd dish:breakfast entr
45 Meat Subst./Vegtble protein

Please select one of the letter choices. These answers help validate the nutritional information.

List Of Ingredients should contain all of the ingredients found in the product. Enter the ingredients as they are listed on the package label.

USDA / Child Nutrition Program (CNP)

Manufacturer Name: _____ (30 Characters)

Contact Name: _____

Address: _____

_____

_____

_____

Date Submitted: _____ (MM/DD/YYYY)

MFR Product Number: _____ (14 Characters)

MFR Product Name: _____ (76 Characters)
Example: (Product Name [Macaroni & Cheese], Pack Size [4/76 oz.], Brand Name [Cheesier])

MFR Product Name Shortened: _____ (40 Characters)
Example: (Product Name [Macaroni & Cheese], Brand Name [Cheesier])

Brand: _____ (40 Characters)

Unit UPC: ___ - _____ - _____ - ___
Example: 0 - 12345 - 12345 - 0

Shipping Container UPC: ____ - _____ - _____ - ___
Example: 100 - 12345 - 12345 - 0

CNP Label - Produced Specifically for CNP? (Y/N):   Y   or   N

CNP Food Category: _____ (2 digits)

CNP Source Code: Select 1,2,3, or 4:
                                                 1 - Standard Reference
                                                 2 - Standardized Recipe Calculation
                                                 3 - Food Industry
                                                 4 - Commodity

NLEA Adjusted Values (Y/N): Y   or   N

Analytical, USDA Data, Calculated (A/U/C):   A or U or C

As Served/Consumed or As Purchased (C/P): C   or   P

Is this an enriched or fortified product? (Y/N): Y   or   N

LIST OF INGREDIENTS: (20 lines by 76 characters)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The **Household Serving Measure** must be selected from the following list of abbreviations. You can use the **Household Serving Description** to describe the measurement in more detail.

CM — Centimeter
CUP — Cup -8 fl. Oz.
FT — Feet - dimension
GAL — Gallon- fluid, volume
GM — Gram, weight
IN — Inch, dimension
KG — Kilogram, weight
LB — Pound, weight
LT — Liter, fluid, volume
M — Meter, dimension
MG — Milligram, weight
ML — Milliliter, fluid, volume
OZ — Ounce, weight
OZ FL — Fluid ounce, volume
PACKAGE — Box,Case,entire unit
PIECE — Portion, serving
PT FL — Pint, fluid, volume
QT FL — Quart, fluid, volume
TBSP — Tablespn, fluid, volume
TSP — Teaspoon,fluid, volume

Each of the underlined **nutritional fields** can hold numbers from 0.00 to 9999999.999, except **Unit of Measure** which is for letters.

The MASTER packaging information is usually based on the entire case.

The **underlined fields** can hold numbers from 0.00 to 999999.9999999.

The **EACH** packaging information is based on the smallest breakdown in the case. Example: EACH would be the individual package. The EACH may be the same as the MASTER or it may be a different breakdown..
i.e. 2/5 lb. bags.
MASTER = 2 5 lb. Bags
EACH = 1 5 lb. Bag

The **underlined fields** can hold numbers from 0.00 to 999999.9999999.

We can fax you an example of all of the Packaging field levels if you need more detailed information. Call SPS at 1/800-777-2924 ext. 152

MFR Product Number: _____(14 Characters)
Serving Size For Nutrients: (Grams) _____.___

Household Serving Size _____.___   Household Serving Measure_____(8 char.)
Example: 12345.12   OZ.

Household Serving Description:_____ (76 characters)

Energy: _____KCal(Calories)   Protein (Total): _____g

Total Fat (lipid): _____g   Sodium: _____mg

Saturated Fat: _____g   Vitamin A: _____IU

Water (Moisture): _____g   Vitamin A: _____RE

Ash: _____g   Vitamin C (Total): _____mg

Carbohydrates(Total): _____g   Iron (Total): _____mg

Cholesterol: _____mg   Calcium: _____mg

Total Dietary Fiber: _____g

MASTER:
Unit Quantity _____   Description: _____ (8 characters)
Example: 1234   Box

Unit Size: _____._____   Unit Size Measure:_____(8 characters)
Example: 123456.1234567   OZ

Unit Size Description: _____ (50 Characters)
Example: 1234 corrugated box

Gross Weight: _____._____ LB   Net Weight: _____._____ LB
Example: 123456.1234567   123456.1234567

Height: _____._____IN   Width: _____._____ IN
Example: 123456.1234567   123456.1234567

Length: _____._____IN   Cube: _____._____ FT
Example: 123456.1234567   123456.1234567

EACH:
Unit Quantity _____   Description: _____ (8 characters)
Example: 1234   Box

Unit Size: _____._____   Unit Size Measure:_____(8 characters)
Example: 123456.1234567   OZ

Unit Size Description: _____ (50 Characters)
Example: 1234 corrugated box

Gross Weight: _____._____ LB   Net Weight: _____._____ LB
Example: 123456.1234567   123456.1234567

Height: _____._____IN   Width: _____._____ IN
Example: 123456.1234567   123456.1234567

Length: _____._____IN   Cube: _____._____ FT
Example: 123456.1234567   123456.1234567

Servings Per Each Unit:_____.___(7 digits with 2 decimals)
Example: 12345.12

Lesson 4:
Key Nutrient Analysis Concepts

All Foods Count in Nutrient Analysis

All food or menu items served in a meal, *including condiments*, are included in the nutrient analysis and count toward meeting the Nutrient Standard for the meal. However, foods that are considered Foods of Minimal Nutritional Value under 7 CFR Parts 210 and 220, Appendices B (i.e., chewing gum, soda water, water ices, and certain candies) can only be included in the nutrient analysis calculations if they are part of a menu item. Appendix A on page 37 provides more information on Foods of Minimal Nutritional Value.

Nutrients Averaged over the School Week

For nutrient-based menu planning and for State agency monitoring of food-based menu planning, menus will be analyzed over a school week.

School Week Definition

For the purposes of nutrient analysis, a school week shall be a normal school week of five consecutive days; to accommodate shortened weeks, the period shall be a minimum of three consecutive days and a maximum of seven consecutive days. Menus for weeks in which school lunches are offered less than three times shall be combined with either the previous week's menus or the subsequent week's menus.

For example, this would be applied when there are only two days of school during the week of Thanksgiving. Those two days could be combined with either the week before or the week after Thanksgiving. The same situation might arise around other holiday periods or during the first and last weeks of school.

By combining a menu week that only has one or two days in it with another week, the menu planner avoids problems in meeting the Nutrient Standard that can arise out of analyzing such a small sample of meals.

Weighted Analysis vs. Unweighted Analysis (Simple Averaging)

To accurately analyze the nutritional composition of meals planned for students for lunch and breakfast, regardless of the menu planning option, regulations require that the nutrient analysis of the meals be based on weighted averages.

The weighted nutrient analysis allocates a greater proportion of nutrients from foods that are selected more frequently; foods that are selected less frequently will contribute fewer nutrients to the nutrient analysis. Weighting is accomplished automatically by the USDA-approved software when the number of planned reimbursable meals and the number of servings of menu items and condiments and their servings sizes are entered for menu analysis.

In order to evaluate the feasibility of using an unweighted nutrient analysis (simple averaging) to determine compliance with the nutrition standards, USDA has authorized a two-year waiver, until July 1, 1998, of the regulatory requirement that nutrient analyses of school meals be conducted using a weighted analysis. With a simple average, the nutrients in all foods are given equal weight regardless of the amounts produced of each item.

Some States have requested the waiver which permits the use of simple averaging instead of weighted analysis. In those States approved for use of simple averaging, the SFA and/or the State agency may choose to use simple averaging to perform the nutrient analysis rather than conducting a weighted analysis.

Weighted Analysis:

The weighted nutrient analysis methodology gives more weight to the nutrients in popular foods that may be frequently selected from a choice or Offer versus Serve menu. This allows for a greater contribution of nutrients to come from the foods selected more frequently. Menu items that are less popular and selected by fewer students will

contribute fewer nutrients to the nutrient analysis, as demonstrated in the example below:

Weighted Nutrient Analysis			
Entree Items	Actual Servings Planned	Data Entry Servings Planned	Nutrient Composition
Pizza	200	200	66.7%
Baked chicken	50	50	16.7%
Chef's salad	50	50	16.7%
Total	300	300	100%

The calculation method for computing a weighted nutrient analysis will require the planner to **enter:**

- Total number of planned reimbursable meals for each day for a weekly menu.
- Portion size(s) for each menu item/condiment
- Projected number of servings for each portion size for each menu item which will be part of a reimbursable meal

Note: Only reimbursable meals are included for nutrient analysis; therefore, the total number of projected servings for each portion size for each menu item and the total number of planned reimbursable meals must not include adult meals or à la carte sales.

If all schools in a grade or age group follow the same centralized menu, weighting should reflect the projected total number of meals planned and the projected servings and portion sizes for each menu item and condiment for all schools using the menu.

Simple Averaging:

For nutrient analysis, simple averaging means giving equal weight to every item within each menu choice. If a school/school district had no menu choices, simple averaging for nutrient analysis could be accomplished by planning a menu for 1 meal and by entering each menu item as 1 serving. However, there are almost always choices, if for nothing other than milk.

The chart below demonstrates giving equal weight in the nutrient analysis for each of 3 entree choices:

Nutritional Analysis Based on Simple Averages			
Entree Items	Actual Servings Planned	Data Entry Servings Planned	Nutrient Composition
Pizza	200	300	33.3%
Baked chicken	50	300	33.3%
Chef's salad	50	300	33.3%
Total	300	900	100%

To perform simple averaging for multiple choices, it is necessary to know the portion size as well as the number of choices that will be offered and the number of selections that a student can make within each group of choices. It is not necessary to know the number of student meals planned or the number of servings planned for each menu item. Instead, the number of planned meals entered into the nutrient analysis software should be a number which is easily divisible by the number of choices.

The number 900 works well because, for choices up to 6, it comes out to an even number of planned servings for each choice. For example if you use the number 900 as the meals planned, you would distribute planned servings of individual food items according to the following chart:

A student may select one serving from this number of choices	Number of planned servings to enter for Menu Planning
1	900
2	450
3	300
4	225
5	180
6	150

If a student may select more than one item from a group of choices, multiply the number of planned servings for

menu planning obtained from the chart above by the number of items the student may choose. For example, if 4 choices are offered, you would select the number 225 from the chart above; and if the student may select 2 items from the 4 choices, you would multiply 225 by 2 to determine the number of planned servings to enter into the computer for each of the 4 choices:

$$225 \times 2 = 450 = \text{the number of planned servings to}$$
enter for menu planning for each choice

Or, for example, if 5 choices are offered, you would select the number 180 from the chart above; and if the student may select 2 items from the 5 choices, you would multiply 180 by 2 to determine the number of planned servings to enter into the computer for each of the 5 choices:

$$180 \times 2 = 360 = \text{the number of planned servings to}$$
enter for menu planning for each choice

See the Appendix B on page 38 for an example of simple averaging for a sample menu.

Option to Combine Breakfast and Lunch Analyses

As an option, an SFA may combine the analyses for school lunch and school breakfast. The combined analysis must be proportionate to the levels of participation in lunch and breakfast. FCS has developed a methodology for calculating the nutrient value of combined breakfast and lunch meals.

Some USDA-approved software has the capability of combining breakfast and lunch analyses. USDA has also developed a worksheet designed to provide a "step-by-step" approach for calculating a combined breakfast and lunch nutrient analysis on paper. The worksheet is in Appendix I, page 9-aa, of the *Healthy School Meals Training* manual.

The worksheet may be used by food service staff utilizing the NuMenus or Assisted NuMenus options if they desire one complete and combined analysis of their school

breakfast and lunch menus. The key components of an accurate calculation require the Nutrient Standards and the analyzed nutrient values of menus for breakfast and lunch to be weighted by the meal participation rates for each.

Special Meals for Children with Special Health Care Needs

Rules regarding whether or not to include special meals for children with special health care needs are as follows:

- When food or menu item substitutions are made for students with special dietary needs, the meals are *not* included in the menu plan for nutrient analysis.
- Special meals that do not include substituted food or menu items (e.g., meals that are modified only for texture) are included in the nutrient analysis.

Appendix A: Foods of Minimal Nutritional Value

Competitive Foods

Competitive foods means any foods sold in competition with the Program to children in food service areas during the lunch periods.

Foods of Minimal Nutritional Value

A Food of Minimal Nutritional Value means:

1. In the case of artificially sweetened foods, a food which provides less than five percent of the Reference Daily Intakes (RDI) for each of eight specified nutrients per serving *and* is included in one of the Categories of Foods of Minimal Nutritional Value (FMNV) listed in Appendix B to 7 CFR Part 210. Those categories include (1) soda water, (2) water ices, (3) chewing gum, and (4) certain candies, including (i) hard candies, (ii) jellies and gums, (iii) marshmallow candies, (iv) fondant, (v) licorice, (vi) spun candy, and (vii) candy-coated popcorn.

2. In the case of all other foods, a food which provides less than five percent of the RDI for each of eight specified nutrients per 100 calories and less than five percent of the RDI for each of eight specified nutrients per serving *and* is included in one of the Categories of FMNV listed in Appendix B to 7 CFR Part 210 (see categories above).

3. The eight nutrients to be assessed for FMNV include (a) protein, (b) vitamin A, (c) vitamin C, (d) niacin, (e) riboflavin, (f) thiamin, (g) calcium, and (h) iron.

4. All foods falling into one of the Categories of FMNV in Appendix B to 7 CFR Part 210 are considered to be FMNV unless the Food and Consumer Service has been petitioned and has granted an exemption for the particular food. Any person may submit a petition to the Food and Consumer Service requesting that an individual food be exempted from a category of Foods of Minimal Nutritional Value. In determining whether an individual food is a FMNV, discrete nutrients added to the food will not be taken into account. Procedures for applying for an exemption are provided in Appendix B to 7 CFR Part 210. Interested persons may contact the Nutrition and Technical Services Division of the Food and Consumer Service at (703) 305-2556 for additional information.

General Information

State agencies and school food authorities shall establish such rules or regulations as are necessary to control the sale of foods in competition with lunches served under the Program. Such rules or regulations shall prohibit the sale of FMNV in the food service areas during the lunch periods. The sale of other competitive foods may, at the discretion of the state agency and school food authority, be allowed in the food service area during the lunch period only if all income from the sale of such foods accrues to the benefit of the nonprofit school food service or the school or student organizations approved by the school. State agencies and school food authorities may impose additional restrictions on the sale of and income from all foods sold at any time throughout schools participating in the Program.

Appendix B: Example of Determining Projected Servings Using Unweighted Analysis (Simple Averaging)

Projected Meals: 900

	Menu	Projected Servings	Steps Necessary to Get Projected Servings for Computer Entry
Select One	Chicken Nuggets Spaghetti with Meat Sauce	450 450	$\frac{900\ \text{Projected Meals}}{2\ \text{menu item choices}}$ = 450 projected servings for each menu item in this group
Select Two	Baked Potato Wedges Seasoned Green Beans Steamed Corn Tossed Salad with Dressing Fresh Fruit Cup	360 360 360 360 360	$\frac{900\ \text{Projected Meals}}{5\ \text{menu item choices}}$ = 180 servings 180 x 2 food item selections = 360 projected servings for each menu item in this group
Select One	Dinner Roll Corn Muffin Garlic Bread	300 300 300	$\frac{900\ \text{Projected Meals}}{3\ \text{menu item choices}}$ = 300 projected servings for each menu item in this group
Select One	Whole Milk 1% Chocolate Milk Skim Milk 1% Lowfat Milk	225 225 225 225	$\frac{900\ \text{Projected Meals}}{4\ \text{menu item choices}}$ = 225 projected servings for each menu item in this group

Lesson 5:

Factors in Selecting Food Items and Quantities from the CN Database

Individuals performing nutrient analysis must have knowledge of the foods that are purchased and how they will be prepared and served in order to select the correct database item. The database frequently contains many entries of the same food item, based on the varieties, types, and forms of the food item that can be purchased and on different preparation methods.

Selecting the Correct Food Item from the Database according to Food Category, Variety/Type, and/or Form:

1. Food Category and Variety/Type

Select the food by category and by variety or type, for example:

Beans, green, Italian

Catfish, farm raised

Cherries, sour, red

Corn, yellow

2. Form of Food Purchased

One of the things to consider when selecting the food is the form in which it is purchased:

a. Processing:

For example: ground vs. whole; halves, sliced or diced; whole kernel or cream-style; with or without peel, seeds, skin, bone; etc.

b. Percentage of fat:

For example: ground meat, dairy products have variable amounts of fat

c. Packing medium:

For example: packed in light or heavy syrup, fruit juice or water; with or without salt

Selecting the Correct Food Item Based on the Food Preparation Method:

Matching an ingredient or menu item with the appropriate food listed in the Child Nutrition (CN) Database is essential in determining the correct caloric and nutrient value of a food. The nutrient content of raw foods is different from the nutrient content of cooked foods. The nutritive values in the database reflect the amount of nutrients in the form specified. The foods in the CN Database include foods which are:

- Raw as served
- Raw, then cooked
- Canned, drained or undrained, heated or unheated
- Frozen, then cooked
- Frozen, then heated
- Condensed, then diluted
- Concentrated
- Dehydrated, then reconstituted
- Dried

Nutrient Retention

Heat Affects Vitamin C Content
1 cup green beans

Legend:
- Fresh, raw
- Cooked, fresh
- Cooked, frozen
- Canned, heated
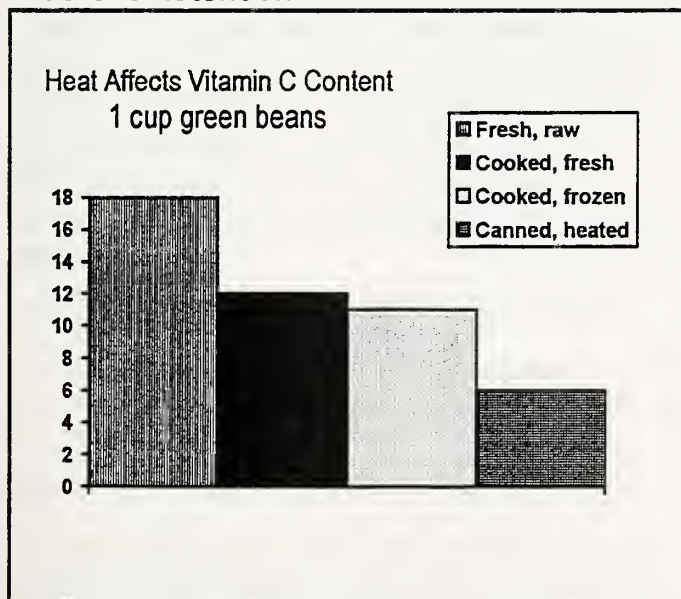
Heat affects the nutrient content of many foods. The nutrient profiles of database foods described as cooked have been adjusted for the nutrient changes that occur with cooking. For example, the nutritive value of frozen green beans cooked with salt will be different from the nutritive value of canned green beans which have been heated.

The database features a list of nutritive values of foods prepared by various cooking methods. Cooked foods may be listed, for example, as:

- Boiled
- Broiled
- Baked
- Fried

Foods with these descriptions should be selected only when the ingredient is **cooked** before being served.

Selecting the Correct Measure of a Food:

Volume vs. Weight

The unit of measurement selected and entered will depend on how the food is used in the recipe or the menu. When selecting data be sure the correct measure of food is entered, for example, teaspoon, gram, cup, gallon, pound or fluid ounce.

The database contains the nutritive values of food items per 100 gram weights. The software will convert any measure (volume, weight) of a food item to a gram weight and calculate its nutritive value for the recipe ingredient amount or menu item. Equivalent weight to volume conversions is a standard feature of USDA-approved nutrient analysis software.

Units of Measurement

- Select correct measure: weight or volume.
- Software will convert measure to a gram weight and calculate its nutritive value.

In selecting the correct measure of a food, it is critical to know whether the food is to be measured by weight or by volume. **Unless it is specifically designated as fluid ounces (fl. oz.) in the database,**

any measure that is listed as ounces will be a weight measure. Weight measures include grams, ounces, and pounds. Volume measures will be listed as teaspoons, tablespoons, fluid ounces, cups, pints, quarts, gallons.

The chart below demonstrates errors that can occur when volume measures are confused with weight measures:

Selecting Correct Measurement

Menu Items
½ cup Raisin Bran
¾ cup Canned Peaches
1 cup Popcorn

	Weight (incorrect)	Volume (correct)
Raisin Bran	4 oz. = 356 cal.	1/2 cup = 79 cal.
Peaches	6 oz. = 92 cal.	3/4 cup = 102 cal.
Popcorn	8 oz. = 587 cal.	1 cup = 23 cal.
	1035 calories	204 calories

Note: 4 oz. = ¼ pound (not 1/2 cup)
          6 oz. = 3/8 pound (not 3/4 cup)
          8 oz. = ½ pound (not 1 cup)
  and   1/2 cup = 4 fluid ounces
          3/4 cup = 6 fluid ounces
          1 cup = 8 fluid ounces

Selecting Items from the CN Database for the "Yield Factor Method" for Recipe Calculations:

All recipes prepared "from scratch" will be entered into the computer using the Yield Factor Method, which is described below:

Yield Factor Method
A method for nutrient analysis of recipes that requires that each recipe ingredient be entered as ready-to-serve or cooked and the amount of each ingredient calculated as a yield from the "as purchased" or raw weight, using the USDA *Food Buying Guide*.

Cooks' Recipes vs. Recipes for Nutrient Analysis

It is important to note that recipes for nutrient analysis and cooks' recipes may be two different things. The Yield Factor Method requires selection of cooked products from the database if the product is cooked before serving. Unless the database meat item has a conversion factor built into it, the weight of the raw meat in a cook's recipe must be converted to the weight of the cooked meat using yield data from USDA's *Food Buying Guide.*

In addition, for nutrient analysis, recipes can be made for single servings, for example 1/2 cup french fries, 1 beef patty, 1 hotdog and bun. The computer is able to convert the nutrients in the single serving recipes to the nutrients in the number of servings that are actually planned or served.

Basic Rules for the Yield Factor Method

- Use the form and portion of the food as served.
- Select raw if not heated or cooked.
- Select cooked if cooked before serving, using the food code for the cooked ingredient.
- Adjust the amount of the ingredient by using a factor for the raw-to-cooked yield or the "as purchased" to the "edible portion."

"As Purchased" vs. "Edible Portion"

The amount of calories and nutrients in a food will vary depending upon the edible portion of the food.

Only the edible portion of a food is listed in the database. The database contains the USDA *Food Buying Guide.* Use the USDA *Food Buying Guide* to convert any **as purchased** weights or measures to **edible portion**. For example, if 10 lbs. of **as purchased** carrots are used to make raw carrot sticks, you must convert the 10 pounds of **as purchased** carrots to the **edible portion** and enter that amount into the computer for nutrient analysis.

For example, the *Food Buying Guide* shows that 1 lb. of "as purchased" or "AP" carrots yields .70 lbs. (70% yield) of "ready-to-cook or serve raw" carrots. Therefore, if a recipe called for 10 pounds of "as purchased" to make 100 1/4 cup servings of raw carrot strips, you would choose CN Database Item

11124, Carrots, fresh, raw, and would enter a weight of 7 lbs. into the recipe.

Recipes that Require Cooking

Recipes that require cooking are a challenge for nutrient analysis–because the recipes contain raw ingredients, and yet we eat cooked products. Cooking changes the nutrient content, the moisture content, and, very frequently, the fat content.

Rather than simply selecting the food code (the computer item number) for the raw ingredient and entering the amount exactly as stated in the recipe to be prepared, the Yield Factor Method involves using the food code for the cooked ingredient from the database and adjusting the amount of ingredient in the recipe by using a factor for the raw-to-cooked yield. The "cooked codes" and yields will generally reflect the losses or gains in moisture and fat, as well as the effect of cooking on other nutrients.

Raw to Cooked Yields for Meats

For some selected items, the CN Database can convert "raw" meats into the "cooked" product weights and nutritive values. For those items, you would select the "cooked" meat item from the database, and then, depending on the software you are using, you would (1) select a code that indicates that you can enter the raw weight of the meat, or (2) select a measure or amount for that food which contains in its description a reference to "yield after cooking," "raw to cooked," "raw yields," or other language that indicates you may enter a raw weight. For these types of measures, you enter the weight of the raw meat as indicated in the recipe and the computer will calculate the equivalent amount of cooked meat.

For meat items which do not have raw to cooked yields, you must calculate the weight of the meat after cooking to enter into the computer. Use the *Food Buying Guide* to determine the edible portion.

The edible portion is the cooked yield of one pound of meat. An edible portion of .74 lb. means that there is a 74 percent cooked yield. Multiply the raw weight of the meat by the percent yield to calculate the cooked weight of the meat and enter the cooked weight into the computer.

For example, a school district is entering a local recipe for beef stew which call for 21 lbs. of stew meat (the recipe calls for browning the meat and draining the fat). Food service staff would check the USDA *Food Buying Guide* for the cooked yield of stew meat (61 percent), calculate the cooked weight, and enter that figure along with the "cooked code" for stew meat. The database item would be 13004, Beef, composite of trimmed retail cuts, cooked. This example is demonstrated below:

Converting Raw Weight of Beef Stew Meat to Cooked Weight	
Example Your recipe calls for 21 lbs. of raw beef stew meat. You need to know the weight of the stew meat after cooking. Information excerpted from the USDA *Food Buying Guide*	
Food as Purchased	Beef, Stew Meat (composite of trimmed retail cuts)
Purchase Unit	Pound
Additional yield information	1 lb. "As Purchased" = .61 lbs. cooked lean meat
Answer: 21 lbs. x .61 = 12.81 lbs. of cooked beef stew meat	

Exception to "Cooked Meat" Procedure

There is an exception to the rule of choosing a cooked meat item from the database and calculating the cooked meat yield: when you are entering a recipe where the fat will remain in the final product, you must select the raw meat database item and enter the weight of the raw meat into the recipe for analysis.

For example: If you were creating a recipe for Red Beans with Sausage, and the recipe instructions specified to slice the uncooked sausage and add it to the beans during cooking, you would need to select the raw sausage data and the weight of the raw product, because the fat which would normally have

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cooked out and been drained off will remain in the final product. (This is a good example of a recipe which you might want to modify, either the cooking method and/or ingredients, to reduce fat and saturated fat.)

Other examples of situations where you would choose the raw meat database item and enter the weight of the raw meat into the recipe for analysis include recipes for soups or stews where raw meat is added to the soup or stew and the fat contained in the raw meat ends up in the final product. However, if the soup or stew is chilled after preparation and the fat is skimmed off the top, it would be appropriate to choose the cooked meat item from the database and enter the cooked weight of the meat.

"As Purchased" vs. "Edible Portion" of Chicken (without bones and or skin)

The "edible portion" and, thus, the nutritive value of a three ounce portion of cooked chicken with the skin and bones will be different from the "edible portion" and the nutritive value of a three ounce portion of cooked boneless, skinless chicken.

If a recipe calls for 25 lbs of raw chicken thighs (4 oz. each) to be baked and served with the skin on, you must convert the 25 lbs. of **as purchased** raw chicken thighs to the equivalent weight of the baked meat and skin only.

Example of Converting Raw Chicken to Cooked Chicken with Skin	
Your recipe calls for 25 lbs. of raw chicken thighs (4 oz. each). You need to know the weight of the edible portion of the cooked chicken meat with skin (without the bones).	
Food as Purchased	Chicken thigh, 4 oz.
Purchase Unit	Pound
Additional yield information	1 lb. "As Purchased" = .52 lbs. cooked chicken with skin
Answer: 25 lbs. x .52 = 13 lbs. of cooked chicken with skin	

The *Food Buying Guide* also contains **as purchased** to **edible portion** yield data for cooked chicken without skin.

Determining Cooked Volume of Dried Pasta

A recipe for Ground Beef and Macaroni calls for cooking the dried pasta in boiling salted water prior to combining it with the other recipe ingredients. This presents a difficult situation for nutrient analysis because the pasta does not absorb the total amount of either the boiling water or the salt during cooking.

This problem was resolved by including pasta that has been prepared with salt in the database. To use this database item, it is necessary to convert the amount of the dried pasta in the recipe to the appropriate amount of cooked pasta, using yield data from the USDA *Food Buying Guide*. The nutrients in the database for the cooked pasta will reflect the water and salt absorbed by the pasta during cooking. Therefore, you will choose the cooked pasta from the database and enter the volume (or weight) of the cooked pasta; the water and salt in the recipe are not entered into the computer for the nutrient analysis.

Example of Converting Dried Weight of Macaroni to Cooked Volume	
Determining cooked volume of 4 lbs. of dried elbow macaroni: from the USDA *Food Buying Guide*	
Food as Purchased	Dried Elbow Macaroni
Purchase Unit	Pound
Servings per purchase unit	19.5
Serving size or portion	1/2 cup
Answer: 1 lb. = 19.5 x ½ cup cooked macaroni = 9.75 cups of cooked macaroni	
4 lbs. x 9.75 cups = 39 cups of cooked macaroni	

However, if the pasta is cooked in and absorbs recipe liquid, the dry pasta would be the appropriate

item to select from the database and the dry weight of the pasta would be entered. For example, a recipe for Lasagna with Ground Beef calls for the lasagna noodles to be cooked in the tomato sauce. In this case, the dried pasta would be the correct database item to select and the dry weight of the pasta called for in the recipe would be entered.

Moisture and Fat Loss or Gain in Purchased Prepared Products:

Many purchased prepared products, such as frozen french fries, chicken nuggets, and fish portions, will undergo further preparation in the school kitchen.

This further preparation generally consists of oven heating (bringing a fully-cooked product to the proper serving temperature) but some school districts may deep-fry some of these products. Because oven-heating generally has minimal impact on moisture or fat loss, fully-cooked, prepared food products that are only oven heated do not need adjustment for fat/moisture loss. However, prepared purchased products may have significant moisture loss and fat gain during deep-frying.

There are some database items for purchased prepared products which will reflect moisture loss and fat gains which occur during deep-frying. For example, if the SFA uses basic generic frozen french-fried potatoes and deep fat fries them in commodity vegetable oil, the best selection would be to choose Item 11404, Potatoes, frozen, french-fried, fried in vegetable oil, from the database. The database item would be the best selection (rather than entering data on the french fries you are purchasing and adjusting for moisture loss and fat gain) because the database item already reflects moisture loss and fat absorption.

However, there are unique purchased prepared products which may be deep-fried. Nutrient analysis data that will reflect fat gain upon frying are not available at this time in the CN Database for many of these products. See pp. 58-59, Lesson 7, Data Entry for Nutrient Analysis, for instructions for creating recipes for fried purchased prepared products.

Fat Gain in Scratch Recipes that are Fried:

The Yield Factor Method of data entry for "from scratch" recipes will not reflect the fat gain if these products are fried.

Because this fat gain must be accounted for, you should not enter these items as recipes, but should choose a database item that is for the fried product. For example, instead of entering a recipe for battered, fried chicken drumsticks, you should choose from the CN Database Item 05067, Chicken; drumstick, meat & skin, cooked, fried, batter.

Lesson 6:
Information and Materials Needed for Nutrient Analysis

The following information/materials are necessary (in addition to USDA-approved software and appropriate hardware) to perform a nutrient analysis of school meals.

Data on SFA and Students
- What menu planning system is being used by the SFA?
- In which grades is Offer vs. Serve implemented?
- Are there central menus or individual school menus? Which grade/age groups are used for menu planning?
- If the school is using NSMP or ANSMP, are they weighting or using simple averaging? Are they combining the breakfast and lunch analyses?

Planned Menus
- choices indicated
- number of selections that may be made within each group of choices indicated

Planned Production Data and Production Records
including :
- numbers of reimbursable meals planned and served
- planned/served production for reimbursable meals for each menu/food item and condiment
- serving sizes for each age/grade group
- recipes and/or recipe numbers
- brand names and identification numbers of purchased prepared food items
- quantity of food planned/actually prepared
- documentation of a la carte, adult, and/or other nonreimbursable meals, including number of portions of each menu item (not applicable if State has a waiver of

- documentation of a la carte, adult, and/or other nonreimbursable meals, including number of portions of each menu item (not applicable if State has a waiver of weighted averages and SFA has chosen to do simple averaging)
- number of reimbursable meals that include substituted foods that are served to children with special health care needs
- documentation of substitutions and/or leftover usage

Food Product Descriptions (Specifications)

- food product descriptions for all foods used in recipes and menus

Nutrient Data on Purchased Prepared Products and Other Foods Not in CN Database

For purchased prepared foods:

- nutrient analysis data sheet from the manufacturer, *or*
- Nutrition Facts label from product packaging

For other foods not in CN Database:

- nutrient analysis data from reliable source, such as the Agricultural Research Service's Nutrient Data Base for Standard Reference

Copies of Local Standardized Recipes and Information on USDA Recipes

- information on USDA recipes used by the SFA, including alternate food ingredients, optional food ingredients, and/or variations
- local standardized recipes, including serving size, yield, all ingredients (including form, packing medium, etc.), correct amounts (including weight, volume, can size, etc.), preparation procedures

Lesson 7:

Data Entry for Nutrient Analysis

Entering Food Items (Ingredients) into the Local Database

You will need to follow the directions provided for your nutrient analysis software to add a food to the local database. However, all data entry will have these steps (not necessarily in this order):

1. Obtain a nutrient analysis data sheet from the manufacturer or the Nutrition Facts label from product packaging for each food item used by the SFA that is not in the CN Database.

2. Assign each product an identification number (some software assigns identification numbers). You cannot use an identification number already in use by the CN Database. Enter the food identification number or use the number assigned by your software.

3. Enter the food name and food category.

4. Enter the manufacturer's name for purchased prepared products.

5. Enter the manufacturer's product code. (Some software programs have "note" fields where you can record a CN Label number, if appropriate, to further identify a product.)

6. Enter the serving size description, e.g., 1/2 cup (#8 scoop), 2.25 oz. patty, 2" x 3" rectangle, etc..

7. Enter the weight per serving in grams or ounces.

8. Enter the nutritive value of each nutrient.

9. Review data entry for correctness.

10. Save the data.

Additional Features:

11. To modify an existing food product in the database, retrieve the product from the database and repeat

steps as needed. Only food items entered locally may be changed.

12. To delete a local food product from the database, follow the software instructions for deleting food products. Only food items entered locally may be deleted.

13. Print a *Food Ingredient Data Report* to list the food ingredient and all corresponding data--nutritive value, food ID number, food category, name, product code etc.

14. Print a *Nutrient Composition Report* to list food items with their associated nutrient values.

Recipe Nutrient Analysis

USDA-Approved Software Capabilities for Nutrient Analysis of Recipes

1. Access, search, retrieve and/or edit existing recipes in the local recipe file.

2. List all file recipes.

3. List recipes with corresponding data: Includes recipe number, name, ingredient, amount of ingredient, yield, portion size, etc.

4. List the nutrient composition of each food ingredient.

5. Sort recipes by food category such as Bread and Cereal Products, Soups, Sandwiches, Salad Dressings, etc.

6. List recipes by ingredients, e.g., all recipes containing apples.

7. Search for previously created recipes by recipe code number, recipe category and recipe name.

8. Adjust recipe yields.
   For example: The recipe yield is 100 servings; if the servings are adjusted to 200 servings, the computer will calculate the amount/measures of food ingredients required to produce 200 servings.

How the Software Calculates the Nutrient Analysis of Recipes:

When recipes are entered into the database, both a serving size and a recipe yield (the number of servings a

recipe makes) are entered. It is important to know that the nutrient analysis software calculates the nutrients in a serving based on the number of servings in the recipe (the yield), not based on the size of the serving entered. In addition, the nutrient analysis software will calculate the gram weight of one serving. (Some software programs also calculate the weight of one serving in ounces.)

If the recipe has been entered accurately using the Yield Factor Method, the gram weight of one serving as calculated by the software should be close to the average actual gram weight of one serving.

Cross-checking Recipes for Possible Errors

The comparison of the gram weight of one serving as calculated by the computer with the average gram weight of one serving can be used to cross-check a recipe for possible errors. It is expected that there will be some variation in the two weights–remember that nutrient analysis is not an exact science and moisture loss may not always be accurately reflected; but a significant discrepancy between the two weights may indicate one of the following: (1) that there is an error in data entry, (2) that the recipe has not been standardized and either the yield or the serving size is inaccurate, or (3) that the Yield Factor Method has not been followed.

If the recipe is portioned using a scoop or measuring spoon, you probably do not know the weight of an average serving. The following procedure can be used to calculate the weight of one serving of a recipe:

- Prepare the recipe and carefully portion out 5 servings.

- Using a gram scale, weigh each serving.

- Add the serving weights and divide the total by 5. This will give you an "average" serving weight.

- To get a better estimate of true serving weight, 2 persons should do the portioning and weighing of 5 samples each.

Adding a Recipe to the Local Database for Nutrient Analysis

You will be able to enter local school recipes into the local database recipe file. You must follow your software directions. Regardless of which software you use, all of these steps are needed to add a recipe to the local database.

Steps to Enter a Local Recipe

1. Enter recipe category, code number and name.
2. Enter recipe yield or number of servings produced (e.g., 100 servings).
3. Enter the serving size description, e.g.,1/2 cup (#8 scoop), 2.25 oz. patty, 2" x 3" rectangle, etc.
4. The Yield Factor Method will be used for all standardized recipes for data entry for nutrient analysis. This requires that each recipe ingredient be entered as ready to serve or cooked, and the amount of each ingredient calculated as a yield from the *as purchased* or raw weight, using the USDA *Food Buying Guide. See pp. 42-48 for more information on the Yield Factor Method.*
5. View the food ingredients listed in the database. Select the correct food item and amount from the database that corresponds with the food ingredient in the recipe according to the directions for the Yield Factor Method.
6. Enter preparation directions, if desired.
7. Review the data entered against the recipe to be sure that (a) the yield is correct, (b) the serving size is correct, (c) all ingredients are included, (d) the correct food item has been chosen from the database, and (e) the amount of each ingredient is correct.
8. Save the recipe to the local database recipe file.
9. Complete a nutrient analysis of the recipe and review the nutrient composition. The following will be calculated for each recipe:
   - The gram weight of one serving
   - Calories
   - Protein
   - Carbohydrate
   - Total fat
   - Saturated fat

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- Vitamin A
- Vitamin C
- Iron
- Calcium
- Percentage of calories from protein
- Percentage of calories from carbohydrate
- Percentage of calories from fat
- Percentage of calories from saturated fat
- Cholesterol
- Sodium
- Dietary fiber

10. Compare the gram weight calculated for one serving with the average gram weight of one serving. (See the section on *How the Software Calculates Recipes* on pp. 53-54 for more information.)

11. Print the recipe, preparation instructions (if applicable), and nutrient analysis.

Updating Local Recipe Data

When local recipes are entered and saved to the recipe file, you can:

1. Change, add or delete food ingredients and amounts.
2. Change preparation and/or serving instructions.

Steps to Create a Recipe Variation

When changing a local database recipe, you may modify the original recipe and then resave it. If you want to keep both recipe variations, you may copy the original recipe, make changes, rename, and save the recipe.

USDA Recipe Variation for Optional Ingredient(s)

When the school district is preparing a USDA recipe exactly as written with the exception that they are simply adding an ingredient(s) that is listed as "optional" in the recipe (e.g., adding the optional ingredient, raisins, to Applesauce Cake), a new recipe should be created and named:

For example: **Applesauce Cake with Raisins**

USDA Recipe C-3

To prepare a recipe for 100 servings , enter item 50043 which is the CN Database number for the USDA recipe for Applesauce Cake; list the amount as 100 pieces. Then choose item 09300, Raisins, seedless, plumped; and enter

2 lbs. which is the amount to be added for 100 servings. Using this procedure for adding an optional ingredient decreases data entry and takes advantage of the USDA nutrient analysis of Applesauce Cake.

USDA Recipe Variation for Alternate Ingredient(s)

When the school district prepares a USDA recipe using an alternate ingredient(s), you will need to create a new recipe by entering the ingredients and their amounts and saving it as a different recipe; *or*, if the software company has entered the USDA recipes with their ingredients, you will copy the appropriate USDA recipe, review it carefully for accuracy, change the ingredient(s) and/or amount(s) as needed, and name and save it as a different recipe.

Creating a Theme Bar Recipe

Salad bars and other food bars, such as pasta bars, taco bars, deli bars, potato bars, etc. can serve as the complete reimbursable lunch or as a food or menu item which is part of the reimbursable lunch. The nutrient analysis of the food bar is based on historical usage of food bar items.

Standardized recipes are developed for food bars and are entered into the database at the local level. The recipe should be constructed based on a "typical" day.

To develop the standardized recipe for a food bar:

1. the number of servings the recipe produces would be the number of people who use the food bar, regardless of whether by students for reimbursable meals, by adults, or for a la carte sales

2. the serving size would be entered into the computer as "one serving"

3. determine the amount of each of the food ingredients for the recipe using the following steps:

    • determine the amount of each ingredient placed on the food bar on a typical day (the amounts placed on the bar at the beginning of the meal service plus any additions to the bar during the meal service)

    • determine the amount of each ingredient left over on the food bar at the end of the meal service

    • subtract the amount left over from the amount placed on the food bar for each ingredient to

determine the amount of each ingredient to enter for the recipe.

Once the recipe has been developed and entered into the database, it can be used in planning and/or analyzing a day's menu. The number of servings entered into the menu for nutrient analysis would be the estimated number of students who are expected to select a reimbursable meal from the food bar (or the estimated number of servings of the menu item which will be selected as part of a reimbursable meal, if the food bar does not offer a full meal).

A separate recipe should be developed for each variation of the food bar. For example, if you rotated 2 salad bars, one that featured iceberg lettuce and another that featured fresh spinach, two separate recipes would need to be developed. If other ingredients vary, each separate combination would need a separate recipe.

Creating Recipes for Fried Purchased Prepared Products

For food products used by the school that are not in the CN Database, school districts will need to obtain manufacturer's nutrient analysis data sheets or use a Nutrition Facts label on the product packaging and enter the nutrient data into their local database. (Manufacturers of quantity foods are not required to provide a Nutrition Facts label, but many have chosen to do so.)

Manufacturers provide nutrient analysis information in one of two ways: either it is "as purchased" data or it is "as served" data.

- **"As purchased"** - "As purchased" nutrient analysis data is information on the nutritional content of a weight and/or a volume or other measurable amount of the product exactly as it is purchased, that is, the nutrients contained in a certain amount of an unprepared cake mix or an unbaked prepared pizza or prefried egg roll.

    The "Nutrition Facts" labels on products are required to provide "as purchased" data. For products which are served as they are purchased, i.e., products which don't have any further preparation other than chilling, heating and/or portioning, this data should be entered into the database and used "as is" in the nutrient analysis of the menu.

For purchased prepared products which will be deep fried in the school kitchen, you will need to prepare a recipe which will adjust for moisture losses and fat gains that will occur with frying (unless the manufacturer has provided "as served" data using the method of cooking and/or other preparation that will be used in the school kitchen). The database code for the type of fat used in frying will also need to be entered.

See Appendix A on page 65 to obtain common moisture losses and fat gains during deep-frying, and incorporate this information into the recipe. Assume zero (0) moisture/fat change for food items that are only heated/reheated.

The following is an example of how this information would be used in the nutrient analysis:

School District A purchases a frozen fish portion which will be fried in the school kitchen. They will need to prepare a recipe for the fish portion and have the computer adjust the "as purchased" nutrient analysis information for moisture loss and fat gain using the appropriate percentages of moisture loss and fat gain in Appendix A. They will also need to know and enter the type of oil that will be used for frying so that the fat gain will be accurately reflected.

- **"As served"** - "As served" nutrient analysis data provides the nutrient values of a purchased prepared product after it has been further prepared. For example, a cake mix will provide "as purchased" data on the unprepared mix and may also provide "as served" data on the mix when prepared according to package directions.

When "as served" nutrient analysis information is provided and the school food service prepares the food according to the specific method of cooking or other preparation described for "as served," the nutrient data provided may be used for menu analysis. When the method of cooking or other preparation differs, a new recipe must be entered into the computer for the prepared product.

Creating Recipes for Standardized Choices

Many school districts have standard choices for milk which do not vary from one meal to the next, and student milk preferences are also consistent. In those circumstances, a recipe can be created for milk choices.

The use of the standardized recipe will reduce the amount of data entry for each menu: instead of entering each type of milk and the number expected to be selected for reimbursable meals, the recipe can be entered along with the total number of milks expected to be selected for reimbursable meals.

The recipe must be based on the choices of milk available and the percentages chosen (if weighted averages are used). If the SFA plans central menus, it would be based on district-wide preferences; if individual school menus are planned, the recipe would be based on the usage in that school. If simple averaging is used, the recipe would give equal weight to each of the choices.

For example: the Central City School District plans central menus and uses weighted averaging. Four kinds of milk are offered every day: whole milk, lowfat milk (1%), chocolate lowfat milk (1%), and nonfat milk. During the past year, 12% of the district purchases of ½ pint cartons were whole milk, 57% were 1% chocolate lowfat milk, 21% were 1% lowfat milk, and 10% were nonfat milk. The Milk Variety Recipe was created as follows:

For 100 servings:

  12 - ½ pints whole milk

  57 - ½ pints 1% chocolate lowfat milk

  21 - ½ pints 1% lowfat milk

  10 - ½ pints nonfat milk

If Central City School District used simple averaging and offered the same four kinds of milk, the Milk Variety Recipe would be as follows:

For 100 servings:

  25 - ½ pints whole milk

  25 - ½ pints 1% chocolate lowfat milk

  25 - ½ pints 1% lowfat milk

  25 - ½ pints nonfat milk

If the standard kinds of milk offered changes, or if the district uses weighted averages and the proportions selected by the students change, then a new recipe must be created.

Other recipes for standardized choices can be created if the items offered do not vary and student choices are consistent (for districts using weighted averages). Some examples of menu items offered as standardized choices by some school districts include fruit juices, fresh fruits, cold cereals, breads, and condiments.

Entering Menu Plans

Enter Specific Menu Plan Data

Site

The site refers to the group for whom the menu is being planned. It may be a school or a group of schools with the same menu:

- Central City Elementary Schools
- Lincoln Elementary School

Date

The date the menu will be served is entered to identify the menu for future reference.

Menu or Meal Type

The type of meal to be planned must be entered because there are specific program requirements for each meal:

- Lunch
- Breakfast

Cycle

A cycle may be one or as many as eight or more weeks. A cycle is a series of menus that are repeated. The software allows entry of the cycle, the cycle week, and the cycle day. The software will also compute the calendar day (Monday, Tuesday, etc.) from the menu date.

- Fall Cycle, Number 2, Weeks 1-4
- Elementary Cycle, Weeks 1-5

Week

A week for nutrient analysis purposes is 3-7 consecutive days. If there are fewer than three consecutive

days in a week, the days in that week are combined with the subsequent or previous week for analysis.

Grade or Age Group

The grade group or the age range is entered to identify which nutrient standard will be used as the yardstick to measure success, such as:

- Grades K-6
- Grades 7-12
- Grades K-3
- Grades 4-12 (this standard is not yet available as a choice in the software. See the instructions below for creating the standard with your software.)
- Ages 7-10
- Ages 11-13

Creating the Nutrient Standard for Grades 4-12 for the Traditional Meal Pattern:

USDA-approved software has not yet been updated to include the nutrient standard for grades 4-12 for the Traditional Meal Pattern. This will require using the software to create this standard. This is accomplished by using the feature for creating customized age-based nutrient standards. Create the standards using age 9 (the age for 4th grade students) through age 17 (the age for 12th graders). This standard will then be used to evaluate all meals planned using the Traditional Meal Pattern for Group IV (Grades 4-12).

Total Reimbursable Meals

Enter the total number of reimbursable meals which are projected to be served, such as:

- 500 Breakfast
- 1,000 Lunch

Use Food Codes or Search Feature to Select Recipes/foods from Database

The food code is the numbers or letters assigned to each food and recipe in the CN Database or the local database. USDA-approved software systems will also allow the menu planner to enter the name of the food or recipe and the software will **search** for similar foods and allow the menu planner to select the correct item.

Portion Size

The portion size must be specified for every food item and menu item. It must relate to the portion sizes available for the food item or menu item in the nutrient analysis software system:

- 1% lowfat milk, 8 fl. oz.
- Corn Flakes cereal, 1 oz.

Projected Servings

Enter the projected production (the projected number of servings that will be prepared for reimbursable meals for each menu item).

Field trips

For NSMP, guidance states that menus for field trip lunches are averaged into the week's menu analysis just as if they were meals served on a school campus, i.e., the menus for field trip lunches are to be incorporated into the menu analysis of the day they are served, along with the regularly scheduled menu items.

Many school districts that plan central menus are concerned that, because field trips are special events with only a relatively small number of students participating on any given day, the nutrients for those meals might get "lost" in the big picture. Another problem is that many schools are not notified about field trips more than 2 weeks in advance of the trip.

To help ensure that field trip meals are as nutritious as the other meals offered by the food service, the meal planner can create a separate menu for the field trip, analyze and compare it to the appropriate nutrient standard, and then adjust to provide a meal that comes as close to the nutrient standard as possible. Then the school food service could be assured that field trip meals would not get lost in the larger numbers. The meals would be nutritious, but would have little, if any, impact on the overall nutrient analysis.

Common Data Entry Errors

Errors in data entry of recipes:

- Incorrect food item selected from database

- Measurements wrong, such as, weight/volume errors, incorrect measures of food items, incorrect recipe serving sizes, incorrect recipe yield, etc.
- "As Purchased" weight used rather than "Edible Portion"
- Recipes entered have not been standardized *or* standardized recipes have been entered, but not used
- Food item (ingredient) left off of recipe

Reminders:

- Carefully select the correct food item from the database.
- Choose the correct measurement, such as volume or weight.
- Use cooked weight for cooked foods.
- Use only standardized recipes. Be sure that written recipes reflect all steps, e.g., make sure the recipe shows the added fat if butter or margarine is brushed on top of rolls.
- Before saving, recheck data entry to find errors.

Errors in data entry of menus:

- Incorrect food item/recipe selected from database
- Portion sizes wrong
- Planned production data (or appropriate numbers for simple averaging) are incorrect
- Condiments are not entered as menu items, e.g., mayonnaise, mustard and/or catsup for hamburgers
- Menu item left off of the nutrient analysis, e.g., bun for hamburger

Reminders:

- Carefully select the correct recipe from the database. Make sure that all recipes reflect the currently purchased food items.
- Choose the correct portion size.
- Make sure the numbers for planned production or for simple averaging are correct.
- Review data entry to check for all menu items and condiments before saving menu.

Appendix A: Common Moisture and Fat Change Values (%) for Purchased Prepared Foods that are Fried

Food Item	Moisture Change %	Fat Change %
Burrito	-11%	+9.5%
Chicken, Nuggets, or Patties, breaded or battered, pre-fried, frozen	-10%	+4%
Corn Dogs, pre-fried, frozen	-8%	+2.5%
Fish Nuggets, Portions, Sticks, breaded or battered, oil-blanched, frozen	-10%	+4%
Funnel cake, from mix	-31%	+10%
Hush Puppies, pre-fried, frozen	-8%	+2.5%
Potatoes, French-fried, oil-blanched, frozen	-27.5%	+3.5%
Potatoes, Chopped, and Formed, Rounds, and Nuggets, oil-blanched, frozen	-5%	+3.5%
Steak, Chicken Fried, pre-fried, frozen	-10%	+2.5%
Taco Shell, Flour, for Taco Salad	-22%	+19%
Vegetables, battered or breaded (eggplant, okra, squash, etc.)	-20%	+8%

Lesson 8:

Performing Nutrient Analysis; Evaluating and Modifying Menus to Achieve the Nutrient Standard

Steps to Perform a Nutrient Analysis

You will need to follow the software's directions to perform a nutrient analysis of a week's menus. Begin by selecting:

Site/Central Menu

Specify the site or central menu to be analyzed.

Grade or Age Group

The grade or age group is entered to identify the nutrient standard that will be used to evaluate the menu planner's success in planning healthier meals.

Date Range

The date range is the range of dates from the first day of the menu analysis week through the last day of the menu analysis week. For example:

- 9/9/96 - 9/13/96
- 9/16/96 - 9/20/96

Meal Type

Specify the meal type, breakfast or lunch. Regulations permit SFAs using nutrient-based menu planning to combine the breakfast and lunch analyses (See Lesson 4, pp. 35-36, for more information on combined analyses). Some computer software has been updated to perform a combined breakfast/lunch analysis, while others have not. If the computer software has not been updated to perform this analysis, see the *Healthy School Meals Training* manual beginning on page 9-16 for forms and directions for performing a manual analysis.

State agencies performing menu review are encouraged to perform separate breakfast and lunch analyses. When

separate analyses are performed, it is easier to identify problems and better focus technical assistance.

Perform the Analysis

Following your software's procedures, perform the nutrient analysis.

Evaluating and Modifying Menus to Achieve the Nutrient Standard

If you find that your weekly menu analysis does not meet the nutritional goals, look at the frequency, portion size, balance of foods and/or nutrient food source list to modify the menu.

1) Evaluate the nutrient analysis of the menus

Evaluate how well the current menu meets the appropriate Nutrient Standard. This will help to determine what, if any, changes must be made to meet the Nutrient Standard.

- How do the menus compare to the Nutrient Standards? What areas need changes? Which areas are okay?
- Do the menus have sufficient calories? Remember the importance of adequate, consistent calorie levels, which are close to the appropriate Nutrient Standard.
- Are the menus too high in fat or saturated fat?
- Are the menus low in calcium, iron, vitamin A, or vitamin C?

2) Review the menus for variety by looking at the frequency with which menu items are offered

The **frequency** with which a particular food or type of food is offered will affect the nutrient content of the menu.

- Are a variety of meats, fruits, vegetables, and grain products offered? Are some whole grains offered?
- Should the total number of low fat or low unsaturated fat food or menu items be increased?
- Are more high vitamin A or high vitamin C foods needed?
- Can a popular high fat item be served fewer times in a cycle or week?

3) Review the Portion Sizes

After making adjustments to how often foods are served, recheck the nutrient analysis. If there are still discrepancies, look at the **portion size** of problem foods next.

- Can a smaller serving be offered of popular foods that may be contributing too much fat, saturated fat or sodium?
- Can the quantity of a high fat ingredient in a recipe be reduced?
- Can a high fat ingredient in a recipe be changed to a lower fat ingredient?
- Can the portion size of a menu item be increased to provide the nutrients needed to meet the Nutrient Standard?

4) Check for "Balance"

Next, look at the **balance** of foods within each day and the week.

- Are the colors in the menu pleasing to the eye?
- Are the food flavor combinations pleasing to the taste?
- Does the menu have pleasing contrasts in shapes and sizes, textures, and temperatures?
- Are there too many foods high in fat or saturated fat in the same day or the same week?
- Can a high fat entree be balanced with low fat side dishes or other low fat entrees during the week?

Nutrient Food Source List

If you still have not met the Nutrient Standards, you can use the *Nutrient Food Source List* in the software program to find ideas for menu modification.

- These lists will suggest foods that might be added or substituted in menus in order to increase the amount of a nutrient found to be below the nutrient standard in the week's breakfast or lunch. For example, you may ask the computer to provide you a list of foods which contain less than 3 grams of fat which also contain at least two milligrams of iron.

When replacing a food, be sure that the levels of the other nutrients in the menu are maintained. After deciding which foods to change and/or which foods to add to the

menu, nutrient values need to be recalculated and compared to the Nutrient Standard.

Print Menu Plan Reports

When the nutrient analysis is complete, print out the appropriate reports. Some reports available are:

- Nutrient composition of CN Database and locally entered food items
- Nutritional analysis of recipes and menus
- Menus: available in both calendar and report formats
- Menu Production Records

Reanalysis of Menus for Leftovers and Substitutions for NSMP and ANSMP

Substitutions

Occasionally it is necessary to make a substitution to a planned menu cycle due to various reasons such as effective use of leftovers, food shortage or improper delivery from vendors. This is a concern because:

- Substitutions may change the nutrient content.
- Meals may no longer meet the Nutrient Standard.

When food substitutions are made due to an emergency situation (i.e., food shortage), it is impractical for menu planners to revise menus and recalculate nutrient amounts, especially if the emergency arises at the end of the week.

Two-Week Window

If the need for service of a substitute item or leftovers occurs prior to a two-week "window" before the day the original menu item is to be served, the week's menus must be reanalyzed to determine if the Nutrient Standards will be met with the substituted item or if other changes will be needed to meet the Nutrient Standards.

Definition

The two-week "window" is the two-week period before the day of the menu item substitution.

For example: Creamed corn is planned for the menu to be served on Wednesday, November 19. The two week window for this menu will begin on Wednesday, November 5 and go through the day before the meal is served, i.e., Tuesday, November 18.

Protocols

1. If the need for a substitution is known more than two weeks before the menu date, or **outside the two-week window**:

- Reanalyze
- Meet the Nutrient Standard

2. If the need for a substitution occurs **within the two-week window**:

- No reanalysis is required
- Substitute with a similar food
- If a food is substituted that is not a similar food according to the definition in this section, a reanalysis should be done

Similar Foods

For the purposes of NSMP, a similar food will mean that the substitution:

- Plays the same role in the meal, for example:
  – Entree
  – Other menu items (side dishes)
  and
- Is from the same food group (breads, fruits, vegetables, etc. - If possible, substitute a like food within a food group, i.e., a citrus fruit for a citrus fruit, a leafy green vegetable for a leafy green vegetable, etc.)

Menu planners are encouraged to monitor the substitutions and reanalyze the menu, if in their judgment, the Nutrient Standards would no longer be met. If the standards are not being met, additional training with staff should be done to reduce substitutions and leftovers.

Leftovers

Effective use of leftovers is encouraged in NSMP:

Leftovers may be frozen and used when the menu item is on the menu again, or they may be used as a substitute at

a later date. The same two-week window rules apply to leftovers as apply to substitutions.

Schools are cautioned that any leftover not frozen for reuse should be used within a safe period. Bacteria continue to grow even under refrigeration.

Theme Bar Substitutions

When substitutions occur on a theme bar, the same rules apply as for a regular lunch, that is, the two-week window applies to substitutions of food items on a theme bar. If knowledge of the need for a substitution occurs prior to two-weeks before the service of the menu, the recipe should be modified to reflect the substituted ingredient and the modified recipe used in the menu analysis. If the need for a substitution occurs within the two-week window prior to the meal service, no reanalysis is required, but the substituted item should be similar to the planned item.

Documentation

Documentation of substitutions and leftover usage, and the date the need for a substitution or leftover usage was known, should be maintained by making notes on the menu production record or by other means.

Adjusting Future Menus

The menus have now been planned and analyzed. Before the menu is used again, SFAs using NSMP and ANSMP may need to adjust/reanalyze the menus for weighted analysis if there are significant changes in participation or projected production. The actual participation and the actual number of menu items served (recorded on the production record) should be compared to the numbers planned. If the differences are such that projected production numbers need to be adjusted, then the menu should be reanalyzed using the new numbers.

Getting Help

Any questions that may arise about food items, recipe analysis, and/or menu analysis that have not been addressed in this manual should be communicated to your State agency.